

What is claimed is:

1. A reaction surface array diagnostic apparatus comprising:
at least one substrate with a plurality of reaction surfaces;
a plate having a plurality of wells extending therethrough;
gasket means for fluidically sealing the plate to the substrate, the gasket means having wells fluidically coupled to the wells in the plate and combining with the wells in the plate to form reaction chambers about the reaction surfaces on the substrate; and
clamp means for clamping the plate, the gasket means and the substrate together such that the gasket means is compressed to form fluid tight reaction chambers about the reaction surfaces.
2. The apparatus of claim 1 wherein the clamp means comprises:
a pair of opposed clamp members joinable to opposed sides of the joined plate, the gasket means and the substrate.
3. The apparatus of claim 1 further comprising:
at least one open ended aperture formed in the plate; and
a projection extending from one of the clamp members and releasably engagable with the recess to releasably fix the clamp member to the plate.
4. The apparatus of claim 1 wherein the clamp means comprises:
a pair of opposed clamp members, each clamp member defining a C-shaped member with two spaced legs extending in the same direction from opposite ends of a central wall.
5. The apparatus of claim 4 wherein:
the legs and the central wall define a channel for receiving a stacked arrangement of the substrate, the gasket and the plate.

6. The apparatus of claim 4 further comprising:
an array formed of a plurality of side-by-side stacks, each stack individually joined by clamp members, the array having a foot print of a microtitre plate.

7. The apparatus of claim 6 further comprising:
a tray having an opening for receiving and supporting the array.

8. The apparatus of claim 7 further comprising:
a sloped surface formed along one edge of the tray for guiding the array into the tray.

9. The apparatus of claim 6 wherein:
two adjacent clamp members of two side-by-side disposed stacks have abutting central walls.

10. The apparatus of claim 1 further comprising:
a non-releasible adhesive fixedly joining the gasket to the plate;

11. A method of preparing a reaction surface array diagnostic apparatus using the apparatus of claim 1.

12. A method of preparing a reaction surface array diagnostic apparatus comprising the steps of:
providing at least one substrate with a plurality of reaction surfaces;
providing a plate with a plurality of wells extending therethrough;
providing a gasket for fluidically sealing the plate to the substrate, the gasket having wells fluidically coupled to the wells in the plate and combining with the wells in the plate to form reaction chambers about the reaction surfaces on the substrate; and

providing a clamp for clamping the plate, the gasket and the substrate together such that the gasket is compressed to form fluid tight reaction chambers about the reaction surfaces.

13. A method of preparing a reaction surface array diagnostic apparatus comprising the steps of:

- providing a substrate with a plurality of reaction surfaces;
- providing a gasket having a plurality of bores extending therethrough;
- providing a plate with a plurality of wells;
- joining the plate with the substrate and the gasket to form a stack with the wells in the plate aligned with the bores in the gasket to form wells about the reaction surfaces on the substrate; and
- compressing the gasket to form a fluid tight seal about each reaction surface on the substrate.

14. The method of claim 13 wherein the step of providing the gasket further comprises the step of:

- providing a silicone gasket.

15. The method of claim 13 wherein the step of compressing further comprises the step of:

- mounting clamp members on opposed side edges of the stack.

16. The method of claim 15 further comprising the step of:

- forming the clamp members with an open channel for engaging one edge of one stack.

17. The method of claim 13 further comprising the step of:

- forming an array of co-planar disposed stacks by abutting the clamp members in a foot print of a microtitre plate.

18. The method of claim 17 further comprising the step of:
providing a tray for releasably receiving the array.
19. The method of claim 18 further comprising the step of:
forming a sloped surface along one edge of the tray to guide a last
inserted stack into the tray.
20. The method of claim 13 further comprising the step of:
disposing a non-releasible adhesive between the gasket and the plate to
fix the gasket to the plate.
21. A reaction surface array diagnostic apparatus for use with a
microtitre plate sized substrate carrying a plurality of reaction surfaces arranged in
microtitre plate well spacing, the apparatus comprising:
a microtitre plate having a plurality of spaced wells, the microtitre plate
formed of a flexible material; and
means, on one surface of the microtitre plate, for joining the microtitre
plate to a substrate.
22. The apparatus of claim 21 wherein:
the microtitre plate is formed of silicone.
23. The apparatus of claim 21 wherein:
the microtitre plate has exterior dimension of about 86mm x 128mm.
24. The apparatus of claim 22 wherein the joining means
comprises:
a releasible adhesive for releasably joining the microtitre plate to a
substrate.

25. The apparatus of claim 24 further comprising:
a glass substrate.
26. The apparatus of claim 21 wherein:
the microtitre plate is formed of a compressible material.
27. The apparatus of claim 22 wherein the joining means
comprises:
an electrostatic force formed between one surface of the silicone
formed microtitre plate and the substrate.
28. The apparatus of claim 21 further comprising:
a single substrate.
29. The apparatus of claim 21 wherein:
the substrates comprises a plurality of substrates joined to the microtitre
plate.
30. The apparatus of claim 21 further comprising:
a pad carried on one surface of the microtitre plate peripherally
surrounding the wells.
31. The apparatus of claim 30 wherein:
the pad defines a recess over the one surface of the microtitre plate.
32. The apparatus of claim 32 wherein:
the pad is homogeneously formed with the microtitre plate.
33. The apparatus of claim 31 wherein:
the pad defines a separate member from the plate; and

means for joining the pad to the plate is disposed between the pad and the plate.

34. The apparatus of claim 33 wherein the joining means comprises:

a permanent, non-releasible adhesive.

35. The apparatus of claim 34 wherein the adhesive comprises:
a double sided silicone/acrylic tape.

36. The apparatus of claim 33 wherein:
the joining means comprises non-mechanical, non chemical adhesive,
short range acting force between the plate and the pad where the plate and the pad are
formed of silicone.

37. The apparatus of claim 30 wherein:
the lip is thicker than the substrate.